

SEQUENCE LISTING

<110> TURECI, Ozlem
 SAHIN, Ugar
 KREITER, Sebastian

<120> Recombinant Vaccines and Use Thereof

<130> VOS-120

<140> US 10/575,640

<141> 2006-04-13

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<151> 2004-10-13

<150> DE 103 47 710.1

<151> 2003-10-14

<160> 66

<170> PatentIn version 3.1

<210> 1

<211> 78

<212> DNA

<213> Homo sapiens

<400> 1

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gagacctggg ccggctcc 78

<210> 2

<211> 26

<212> PRT

<213> Homo sapiens

<400> 2

Met Arg Val Thr Ala Pro Arg Thr Leu Ile Leu Leu Leu Ser Gly Ala
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Leu Ala Leu Thr Glu Thr Trp Ala Gly Ser
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<210> 3

<211> 168

<212> DNA

<213> Homo sapiens

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gctactgtga tgtgtaggag gaagagctca ggtggaaaag gagggagcta ctctcaggct 120

gcgtccagcg acagtgccca gggctctgat gtgtctctca cagcttga 168

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 <211> 55
 <212> PRT
 <213> Homo sapiens

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Ile Val Gly Ile Val Ala Gly Leu Ala Val Leu Ala Val Val Val Ile
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Gly Ala Val Val Ala Thr Val Met Cys Arg Arg Lys Ser Ser Gly Gly
 20 25 30

Lys Gly Gly Ser Tyr Ser Gln Ala Ala Ser Ser Asp Ser Ala Gln Gly
 35 40 45

Ser Asp Val Ser Leu Thr Ala
 50 55

<210> 5
 <211> 129
 <212> DNA
 <213> Homo sapiens

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 ctgagctga 129

<210> 6
 <211> 42
 <212> PRT
 <213> Homo sapiens

<400> 6

Gln Ser Lys Met Leu Ser Gly Val Gly Gly Phe Val Leu Gly Leu Leu
 1 5 10 15

Phe Leu Gly Ala Gly Leu Phe Ile Tyr Phe Arg Asn Gln Lys Gly His
 20 25 30

Ser Gly Leu Gln Pro Arg Gly Phe Leu Ser
 35 40

<210> 7
 <211> 24
 <212> DNA

<213> Artificial Sequence

<220>

<223> DNA of restriction site in human HLA class I domains

<400> 7

ctgcaggtcg actctagagg atcc

24

<210> 8

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Restriction site in human HLA class I domains

<400> 8

Leu Gln Val Asp Ser Arg Gly Ser

1

5

<210> 9

<211> 1683

<212> DNA

<213> Human cytomegalovirus

<400> 9

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cacgtgctga aagccgtgtt tagtcgcggc gatacgccgg tgctgccgca cgagacgcga 120

ctcctgcaga cgggtatcca cgtacgcgtg agccagccct cgctgatctt ggtatcgcag 180

tacacgcccc actcgacgcc atgccaccgc ggcgacaatc agctgcaggt gcagcacacg 240

tactttacgg gcagcgaggt ggagaacgtg tcgggtcaacg tgcacaacct cacgggccga 300

agcatctgcc ccagccagga gcccatgtcg atctatgtgt acgcgctgcc gctcaagatg 360

ctgaacatcc ccagcatcaa cgtgcaccac taccgcgtcg cggccgagcg caaacaccga 420

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ctcacggtct cgggactggc ctggacgcgt cagcagaacc agtggaaaga gcccgcgctc 540

tactacacgt cagcgttcgt gtttcccacc aaggacgtgg cactgcggca cgtggtgtgc 600

gcgcacgagc tggtttgctc catggagaac acgcgcgcaa ccaagatgca ggtgataggt 660

gaccagtacg tcaaggtgta cctggagtcc ttctgcgagg acgtgccctc cggcaagctc 720

tttatgcacg tcacgctggg ctctgacgtg gaagaggacc tgacgatgac ccgcaacctg 780

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 gctacggttc agggtcagaa tctgaagtac caggaattct tctgggacgc caacgacatc 1560
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 ggt 1683

<210> 10
 <211> 561
 <212> PRT
 <213> Human cytomegalovirus

<400> 10

Met Glu Ser Arg Gly Arg Arg Cys Pro Glu Met Ile Ser Val Leu Gly
 1 5 10 15

Pro Ile Ser Gly His Val Leu Lys Ala Val Phe Ser Arg Gly Asp Thr
 20 25 30

Pro Val Leu Pro His Glu Thr Arg Leu Leu Gln Thr Gly Ile His Val
 35 40 45

Arg Val Ser Gln Pro Ser Leu Ile Leu Val Ser Gln Tyr Thr Pro Asp
 50 55 60

Ser Thr Pro Cys His Arg Gly Asp Asn Gln Leu Gln Val Gln His Thr
 65 70 75 80

Tyr Phe Thr Gly Ser Glu Val Glu Asn Val Ser Val Asn Val His Asn
 85 90 95

Pro Thr Gly Arg Ser Ile Cys Pro Ser Gln Glu Pro Met Ser Ile Tyr

100					105					110					
Val	Tyr	Ala	Leu	Pro	Leu	Lys	Met	Leu	Asn	Ile	Pro	Ser	Ile	Asn	Val
		115					120					125			
His	His	Tyr	Pro	Ser	Ala	Ala	Glu	Arg	Lys	His	Arg	His	Leu	Pro	Val
		130					135					140			
Ala	Asp	Ala	Val	Ile	His	Ala	Ser	Gly	Lys	Gln	Met	Trp	Gln	Ala	Arg
		145					150					155			
Leu	Thr	Val	Ser	Gly	Leu	Ala	Trp	Thr	Arg	Gln	Gln	Asn	Gln	Trp	Lys
				165					170					175	
Glu	Pro	Asp	Val	Tyr	Tyr	Thr	Ser	Ala	Phe	Val	Phe	Pro	Thr	Lys	Asp
			180					185					190		
Val	Ala	Leu	Arg	His	Val	Val	Cys	Ala	His	Glu	Leu	Val	Cys	Ser	Met
		195					200					205			
Glu	Asn	Thr	Arg	Ala	Thr	Lys	Met	Gln	Val	Ile	Gly	Asp	Gln	Tyr	Val
		210					215					220			
Lys	Val	Tyr	Leu	Glu	Ser	Phe	Cys	Glu	Asp	Val	Pro	Ser	Gly	Lys	Leu
		225					230					235			
Phe	Met	His	Val	Thr	Leu	Gly	Ser	Asp	Val	Glu	Glu	Asp	Leu	Thr	Met
				245					250					255	
Thr	Arg	Asn	Pro	Gln	Pro	Phe	Met	Arg	Pro	His	Glu	Arg	Asn	Gly	Phe
			260					265					270		
Thr	Val	Leu	Cys	Pro	Lys	Asn	Met	Ile	Ile	Lys	Pro	Gly	Lys	Ile	Ser
		275					280					285			
His	Ile	Met	Leu	Asp	Val	Ala	Phe	Thr	Ser	His	Glu	His	Phe	Gly	Leu
		290					295					300			
Leu	Cys	Pro	Lys	Ser	Ile	Pro	Gly	Leu	Ser	Ile	Ser	Gly	Asn	Leu	Leu
		305					310					315			
Met	Asn	Gly	Gln	Gln	Ile	Phe	Leu	Glu	Val	Gln	Ala	Ile	Arg	Glu	Thr
				325					330					335	
Val	Glu	Leu	Arg	Gln	Tyr	Asp	Pro	Val	Ala	Ala	Leu	Phe	Phe	Phe	Asp

	340		345		350												
Ile	Asp	Leu	Leu	Leu	Gln	Arg	Gly	Pro	Gln	Tyr	Ser	Glu	His	Pro	Thr		
	355						360					365					
Phe	Thr	Ser	Gln	Tyr	Arg	Ile	Gln	Gly	Lys	Leu	Glu	Tyr	Arg	His	Thr		
	370					375					380						
Trp	Asp	Arg	His	Asp	Glu	Gly	Ala	Ala	Gln	Gly	Asp	Asp	Asp	Val	Trp		
385					390					395					400		
Thr	Ser	Gly	Ser	Asp	Ser	Asp	Glu	Glu	Leu	Val	Thr	Thr	Glu	Arg	Lys		
				405					410					415			
Thr	Pro	Arg	Val	Thr	Gly	Gly	Gly	Ala	Met	Ala	Gly	Ala	Ser	Thr	Ser		
			420					425					430				
Ala	Gly	Arg	Lys	Arg	Lys	Ser	Ala	Ser	Ser	Ala	Thr	Ala	Cys	Thr	Ser		
		435					440					445					
Gly	Val	Met	Thr	Arg	Gly	Arg	Leu	Lys	Ala	Glu	Ser	Thr	Val	Ala	Pro		
	450					455					460						
Glu	Glu	Asp	Thr	Asp	Glu	Asp	Ser	Asp	Asn	Glu	Ile	His	Asn	Pro	Ala		
465					470					475					480		
Val	Phe	Thr	Trp	Pro	Pro	Trp	Gln	Ala	Gly	Ile	Leu	Ala	Arg	Asn	Leu		
				485					490					495			
Val	Pro	Met	Val	Ala	Thr	Val	Gln	Gly	Gln	Asn	Leu	Lys	Tyr	Gln	Glu		
			500					505					510				
Phe	Phe	Trp	Asp	Ala	Asn	Asp	Ile	Tyr	Arg	Ile	Phe	Ala	Glu	Leu	Glu		
		515					520				525						
Gly	Val	Trp	Gln	Pro	Ala	Ala	Gln	Pro	Lys	Arg	Arg	Arg	His	Arg	Gln		
	530					535					540						
Asp	Ala	Leu	Pro	Gly	Pro	Cys	Ile	Ala	Ser	Thr	Pro	Lys	Lys	His	Arg		
545					550					555					560		
Gly																	

<211> 1962
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> DNA encoding human HLA class I domains and CMV pp65

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 gagacctggg ccggctccct gcaggtcgac tctagaggat ccaccatgga gtcgcgcggg 120
 cgccgttgtc ccgaaatgat atccgtactg ggtcccattt cggggcacgt gctgaaagcc 180
 gtgttttagtc gcggcgatac gccggtgctg ccgcacgaga cgcgactcct gcagacgggt 240
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 caggagccca tgtcgatcta tgtgtacgcg ctgccgctca agatgctgaa catccccagc 480
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 gtgatgtgta ggaggaagag ctcaggtgga aaaggaggga gctactctca ggctgcgtcc 1920
 agcgacagtg cccagggtc tgatgtgtct ctcacagctt ga 1962

<210> 12
 <211> 653
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Fusion protein of human HLA class I domains and CMV pp65

<400> 12

Met Arg Val Thr Ala Pro Arg Thr Leu Ile Leu Leu Leu Ser Gly Ala
 1 5 10 15

Leu Ala Leu Thr Glu Thr Trp Ala Gly Ser Leu Gln Val Asp Ser Arg
 20 25 30

Gly Ser Thr Met Glu Ser Arg Gly Arg Arg Cys Pro Glu Met Ile Ser
 35 40 45

Val Leu Gly Pro Ile Ser Gly His Val Leu Lys Ala Val Phe Ser Arg
 50 55 60

Gly Asp Thr Pro Val Leu Pro His Glu Thr Arg Leu Leu Gln Thr Gly
 65 70 75 80

Ile His Val Arg Val Ser Gln Pro Ser Leu Ile Leu Val Ser Gln Tyr
 85 90 95

Thr Pro Asp Ser Thr Pro Cys His Arg Gly Asp Asn Gln Leu Gln Val
 100 105 110

Gln His Thr Tyr Phe Thr Gly Ser Glu Val Glu Asn Val Ser Val Asn
 115 120 125

Val His Asn Pro Thr Gly Arg Ser Ile Cys Pro Ser Gln Glu Pro Met
 130 135 140

Ser Ile Tyr Val Tyr Ala Leu Pro Leu Lys Met Leu Asn Ile Pro Ser
 145 150 155 160

Ile Asn Val His His Tyr Pro Ser Ala Ala Glu Arg Lys His Arg His
 165 170 175

Leu Pro Val Ala Asp Ala Val Ile His Ala Ser Gly Lys Gln Met Trp
 180 185 190

Gln Ala Arg Leu Thr Val Ser Gly Leu Ala Trp Thr Arg Gln Gln Asn
 195 200 205

Gln Trp Lys Glu Pro Asp Val Tyr Tyr Thr Ser Ala Phe Val Phe Pro
 210 215 220

Thr Lys Asp Val Ala Leu Arg His Val Val Cys Ala His Glu Leu Val
 225 230 235 240

Cys Ser Met Glu Asn Thr Arg Ala Thr Lys Met Gln Val Ile Gly Asp
 245 250 255

Gln Tyr Val Lys Val Tyr Leu Glu Ser Phe Cys Glu Asp Val Pro Ser
 260 265 270

Gly Lys Leu Phe Met His Val Thr Leu Gly Ser Asp Val Glu Glu Asp
 275 280 285

Leu Thr Met Thr Arg Asn Pro Gln Pro Phe Met Arg Pro His Glu Arg
 290 295 300

Asn Gly Phe Thr Val Leu Cys Pro Lys Asn Met Ile Ile Lys Pro Gly
 305 310 315 320

Lys Ile Ser His Ile Met Leu Asp Val Ala Phe Thr Ser His Glu His
 325 330 335

Phe Gly Leu Leu Cys Pro Lys Ser Ile Pro Gly Leu Ser Ile Ser Gly
 340 345 350

Asn Leu Leu Met Asn Gly Gln Gln Ile Phe Leu Glu Val Gln Ala Ile
 355 360 365

Arg Glu Thr Val Glu Leu Arg Gln Tyr Asp Pro Val Ala Ala Leu Phe
 370 375 380

Phe Phe Asp Ile Asp Leu Leu Leu Gln Arg Gly Pro Gln Tyr Ser Glu
385 390 395 400

His Pro Thr Phe Thr Ser Gln Tyr Arg Ile Gln Gly Lys Leu Glu Tyr
405 410 415

Arg His Thr Trp Asp Arg His Asp Glu Gly Ala Ala Gln Gly Asp Asp
420 425 430

Asp Val Trp Thr Ser Gly Ser Asp Ser Asp Glu Glu Leu Val Thr Thr
435 440 445

Glu Arg Lys Thr Pro Arg Val Thr Gly Gly Gly Ala Met Ala Gly Ala
450 455 460

Ser Thr Ser Ala Gly Arg Lys Arg Lys Ser Ala Ser Ser Ala Thr Ala
465 470 475 480

Cys Thr Ser Gly Val Met Thr Arg Gly Arg Leu Lys Ala Glu Ser Thr
485 490 495

Val Ala Pro Glu Glu Asp Thr Asp Glu Asp Ser Asp Asn Glu Ile His
500 505 510

Asn Pro Ala Val Phe Thr Trp Pro Pro Trp Gln Ala Gly Ile Leu Ala
515 520 525

Arg Asn Leu Val Pro Met Val Ala Thr Val Gln Gly Gln Asn Leu Lys
530 535 540

Tyr Gln Glu Phe Phe Trp Asp Ala Asn Asp Ile Tyr Arg Ile Phe Ala
545 550 555 560

Glu Leu Glu Gly Val Trp Gln Pro Ala Ala Gln Pro Lys Arg Arg Arg
565 570 575

His Arg Gln Asp Ala Leu Pro Gly Pro Cys Ile Ala Ser Thr Pro Lys
580 585 590

Lys His Arg Gly Gly Ser Ile Val Gly Ile Val Ala Gly Leu Ala Val
595 600 605

Leu Ala Val Val Val Ile Gly Ala Val Val Ala Thr Val Met Cys Arg
610 615 620

Arg Lys Ser Ser Gly Gly Lys Gly Gly Ser Tyr Ser Gln Ala Ala Ser
 625 630 635 640

Ser Asp Ser Ala Gln Gly Ser Asp Val Ser Leu Thr Ala
 645 650

<210> 13
 <211> 1923
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> DNA encoding human HLA class I/II domains and CMV pp65

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 ttcgtgtttc ccaccaagga cgtggcactg cggcacgtgg tgtgcgcgca cgagctgggt 720
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gaggacaccg acgaggattc cgacaacgaa atccacaatc cggccgtgtt cacctggccg 1560
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aagatgctga gtggagtcgg gggctttgtg ctgggcctgc tcttccttg ggccgggctg 1860
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tga 1923

<210> 14
<211> 640
<212> PRT
<213> Artificial Sequence

<220>
<223> Human HLA class I/II domains and CMV pp65 fusion protein
<400> 14

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Leu Ala Leu Thr Glu Thr Trp Ala Gly Ser Leu Gln Val Asp Ser Arg
20 25 30

Gly Ser Thr Met Glu Ser Arg Gly Arg Arg Cys Pro Glu Met Ile Ser
35 40 45

Val Leu Gly Pro Ile Ser Gly His Val Leu Lys Ala Val Phe Ser Arg
50 55 60

Gly Asp Thr Pro Val Leu Pro His Glu Thr Arg Leu Leu Gln Thr Gly
65 70 75 80

Ile His Val Arg Val Ser Gln Pro Ser Leu Ile Leu Val Ser Gln Tyr
85 90 95

Thr Pro Asp Ser Thr Pro Cys His Arg Gly Asp Asn Gln Leu Gln Val

100					105					110					
Gln	His	Thr	Tyr	Phe	Thr	Gly	Ser	Glu	Val	Glu	Asn	Val	Ser	Val	Asn
		115					120					125			
Val	His	Asn	Pro	Thr	Gly	Arg	Ser	Ile	Cys	Pro	Ser	Gln	Glu	Pro	Met
	130					135					140				
Ser	Ile	Tyr	Val	Tyr	Ala	Leu	Pro	Leu	Lys	Met	Leu	Asn	Ile	Pro	Ser
145					150					155					160
Ile	Asn	Val	His	His	Tyr	Pro	Ser	Ala	Ala	Glu	Arg	Lys	His	Arg	His
				165					170					175	
Leu	Pro	Val	Ala	Asp	Ala	Val	Ile	His	Ala	Ser	Gly	Lys	Gln	Met	Trp
			180					185					190		
Gln	Ala	Arg	Leu	Thr	Val	Ser	Gly	Leu	Ala	Trp	Thr	Arg	Gln	Gln	Asn
		195					200					205			
Gln	Trp	Lys	Glu	Pro	Asp	Val	Tyr	Tyr	Thr	Ser	Ala	Phe	Val	Phe	Pro
	210					215					220				
Thr	Lys	Asp	Val	Ala	Leu	Arg	His	Val	Val	Cys	Ala	His	Glu	Leu	Val
225					230					235					240
Cys	Ser	Met	Glu	Asn	Thr	Arg	Ala	Thr	Lys	Met	Gln	Val	Ile	Gly	Asp
				245					250					255	
Gln	Tyr	Val	Lys	Val	Tyr	Leu	Glu	Ser	Phe	Cys	Glu	Asp	Val	Pro	Ser
			260					265					270		
Gly	Lys	Leu	Phe	Met	His	Val	Thr	Leu	Gly	Ser	Asp	Val	Glu	Glu	Asp
		275					280					285			
Leu	Thr	Met	Thr	Arg	Asn	Pro	Gln	Pro	Phe	Met	Arg	Pro	His	Glu	Arg
	290					295					300				
Asn	Gly	Phe	Thr	Val	Leu	Cys	Pro	Lys	Asn	Met	Ile	Ile	Lys	Pro	Gly
305					310					315					320
Lys	Ile	Ser	His	Ile	Met	Leu	Asp	Val	Ala	Phe	Thr	Ser	His	Glu	His
				325					330					335	
Phe	Gly	Leu	Leu	Cys	Pro	Lys	Ser	Ile	Pro	Gly	Leu	Ser	Ile	Ser	Gly

340	345	350
Asn Leu Leu Met Asn Gly Gln Gln Ile Phe Leu Glu Val Gln Ala Ile		
355	360	365
Arg Glu Thr Val Glu Leu Arg Gln Tyr Asp Pro Val Ala Ala Leu Phe		
370	375	380
Phe Phe Asp Ile Asp Leu Leu Leu Gln Arg Gly Pro Gln Tyr Ser Glu		
385	390	395 400
His Pro Thr Phe Thr Ser Gln Tyr Arg Ile Gln Gly Lys Leu Glu Tyr		
405	410	415
Arg His Thr Trp Asp Arg His Asp Glu Gly Ala Ala Gln Gly Asp Asp		
420	425	430
Asp Val Trp Thr Ser Gly Ser Asp Ser Asp Glu Glu Leu Val Thr Thr		
435	440	445
Glu Arg Lys Thr Pro Arg Val Thr Gly Gly Gly Ala Met Ala Gly Ala		
450	455	460
Ser Thr Ser Ala Gly Arg Lys Arg Lys Ser Ala Ser Ser Ala Thr Ala		
465	470	475 480
Cys Thr Ser Gly Val Met Thr Arg Gly Arg Leu Lys Ala Glu Ser Thr		
485	490	495
Val Ala Pro Glu Glu Asp Thr Asp Glu Asp Ser Asp Asn Glu Ile His		
500	505	510
Asn Pro Ala Val Phe Thr Trp Pro Pro Trp Gln Ala Gly Ile Leu Ala		
515	520	525
Arg Asn Leu Val Pro Met Val Ala Thr Val Gln Gly Gln Asn Leu Lys		
530	535	540
Tyr Gln Glu Phe Phe Trp Asp Ala Asn Asp Ile Tyr Arg Ile Phe Ala		
545	550	555 560
Glu Leu Glu Gly Val Trp Gln Pro Ala Ala Gln Pro Lys Arg Arg Arg		
565	570	575
His Arg Gln Asp Ala Leu Pro Gly Pro Cys Ile Ala Ser Thr Pro Lys		

580

585

590

Lys His Arg Gly Gly Ser Gln Ser Lys Met Leu Ser Gly Val Gly Gly
 595 600 605

Phe Val Leu Gly Leu Leu Phe Leu Gly Ala Gly Leu Phe Ile Tyr Phe
 610 615 620

Arg Asn Gln Lys Gly His Ser Gly Leu Gln Pro Arg Gly Phe Leu Ser
 625 630 635 640

<210> 15
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 <213> Homo sapiens

<400> 15

Pro Ser Ser Gln Pro Thr Ile Pro Ile Val Gly Ile Ile Ala Gly Leu
 1 5 10 15

Val Leu Phe Gly Ala Val Ile Thr Gly Ala Val Val Ala Ala Val Met
 20 25 30

Trp Arg Arg Lys Ser Ser Asp Arg Lys Gly Gly Ser Tyr Ser Gln Ala
 35 40 45

Ala Ser Ser Asp Ser Ala Gln Gly Ser Asp Val Ser Leu Thr Ala Cys
 50 55 60

Lys Val
 65

<210> 16
 <211> 24
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<400> 16

Gly Ser Tyr Ser Gln Ala Ala Ser Ser Asp Ser Ala Gln Gly Ser Asp
 1 5 10 15

Val Ser Leu Thr Ala Cys Lys Val
 20

<210> 17
 <211> 63
 <212> PRT

<213> Homo sapiens

<400> 17

Pro Ser Ser Gln Ser Thr Val Pro Ile Val Gly Ile Val Ala Gly Leu
1 5 10 15

Ala Val Leu Ala Val Val Val Ile Gly Ala Val Val Ala Ala Val Met
20 25 30

Cys Arg Arg Lys Ser Ser Gly Gly Lys Gly Gly Ser Tyr Ser Gln Ala
35 40 45

Ala Cys Ser Asp Ser Ala Gln Gly Ser Asp Val Ser Leu Thr Ala
50 55 60

<210> 18

<211> 21

<212> PRT

<213> Homo sapiens

<400> 18

Gly Ser Tyr Ser Gln Ala Ala Cys Ser Asp Ser Ala Gln Gly Ser Asp
1 5 10 15

Val Ser Leu Thr Ala
20

<210> 19

<211> 67

<212> PRT

<213> Homo sapiens

<400> 19

Pro Ser Ser Gln Pro Thr Ile Pro Ile Val Gly Ile Val Ala Gly Leu
1 5 10 15

Ala Val Leu Ala Val Leu Ala Val Leu Gly Ala Met Val Ala Val Val
20 25 30

Met Cys Arg Arg Lys Ser Ser Gly Gly Lys Gly Gly Ser Cys Ser Gln
35 40 45

Ala Ala Ser Ser Asn Ser Ala Gln Gly Ser Asp Glu Ser Leu Ile Ala
50 55 60

Cys Lys Ala
65

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<400> 20

Ser Ala Gln Gly Ser Asp Glu Ser Leu Ile Ala Cys Lys Ala
1 5 10

<210> 21
<211> 62
<212> PRT
<213> Homo sapiens

<400> 21

Pro Ala Ser Gln Pro Thr Ile Pro Ile Val Gly Ile Ile Ala Gly Leu
1 5 10 15

Val Leu Leu Gly Ser Val Val Ser Gly Ala Val Val Ala Ala Val Ile
20 25 30

Trp Arg Lys Lys Ser Ser Gly Gly Lys Gly Gly Ser Tyr Ser Lys Ala
35 40 45

Glu Trp Ser Asp Ser Ala Gln Gly Ser Glu Ser His Ser Leu
50 55 60

<210> 22
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<213> Homo sapiens

<400> 22

Gly Ser Tyr Ser Lys Ala Glu Trp Ser Asp Ser Ala Gln Gly Ser Glu
1 5 10 15

Ser His Ser Leu
20

<210> 23
<211> 66
<212> PRT
<213> Homo sapiens

<400> 23

Gln Ser Pro Gln Pro Thr Ile Pro Ile Val Gly Ile Val Ala Gly Leu
1 5 10 15

Val Val Leu Gly Ala Val Val Thr Gly Ala Val Val Ala Ala Val Met
20 25 30

Trp Arg Lys Lys Ser Ser Asp Arg Asn Arg Gly Ser Tyr Ser Gln Ala
35 40 45

Ala Val Thr Asp Ser Ala Gln Gly Ser Gly Val Ser Leu Thr Ala Asn
50 55 60

Lys Val
65

<210> 24
<211> 27
<212> PRT
<213> Homo sapiens

<400> 24

Arg Asn Arg Gly Ser Tyr Ser Gln Ala Ala Val Thr Asp Ser Ala Gln
1 5 10 15

Gly Ser Gly Val Ser Leu Thr Ala Asn Lys Val
20 25

<210> 25
<211> 37
<212> PRT
<213> Homo sapiens

<400> 25

Val Val Cys Ala Leu Gly Leu Thr Val Gly Leu Val Gly Ile Ile Ile
1 5 10 15

Gly Thr Ile Phe Ile Ile Lys Gly Leu Arg Lys Ser Asn Ala Ala Glu
20 25 30

Arg Arg Gly Pro Leu
35

<210> 26
<211> 12
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<213> Homo sapiens

<400> 26

Arg Lys Ser Asn Ala Ala Glu Arg Arg Gly Pro Leu

1 5 10

<210> 27
<211> 38
<212> PRT
<213> Homo sapiens

<400> 27

Met Leu Ser Gly Val Gly Gly Phe Val Leu Gly Leu Leu Phe Leu Ala
1 5 10 15

Gly Leu Phe Ile Tyr Phe Arg Asn Gln Lys Gly His Ser Gly Leu Gln
20 25 30

Pro Arg Gly Phe Leu Ser
35

<210> 28
<211> 12
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<213> Homo sapiens

<400> 28

Gly His Ser Gly Leu Gln Pro Arg Gly Phe Leu Ser
1 5 10

<210> 29
<211> 37
<212> PRT
<213> Homo sapiens

<400> 29

Val Val Cys Ala Leu Gly Leu Ser Val Gly Leu Met Gly Ile Val Val
1 5 10 15

Gly Thr Val Phe Ile Ile Gln Gly Leu Arg Ser Val Gly Ala Ser Arg
20 25 30

His Gln Gly Pro Leu
35

<210> 30
<211> 10
<212> PRT
<213> Homo sapiens

<400> 30

Val Gly Ala Ser Arg His Gln Gly Pro Leu

1 5 10

<210> 31
<211> 31
<212> PRT
<213> Homo sapiens

<400> 31

Met Leu Ser Gly Ile Gly Gly Phe Val Leu Gly Leu Ile Phe Leu Gly
1 5 10 15

Leu Gly Leu Ile Ile His His Arg Ser Gln Lys Gly Leu Leu His
20 25 30

<210> 32
<211> 8
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<213> Homo sapiens

<400> 32

Arg Ser Gln Lys Gly Leu Leu His
1 5

<210> 33
<211> 37
<212> PRT
<213> Homo sapiens

<400> 33

Val Leu Cys Ala Leu Gly Leu Val Leu Gly Leu Val Gly Ile Ile Val
1 5 10 15

Gly Thr Val Leu Ile Ile Lys Ser Leu Arg Ser Gly His Asp Pro Arg
20 25 30

Ala Gln Gly Thr Leu
35

<210> 34
<211> 12
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<213> Homo sapiens

<400> 34

Arg Ser Gly His Asp Pro Arg Ala Gln Gly Thr Leu
1 5 10

<210> 35

<211> 33
<212> PRT
<213> Homo sapiens

<400> 35

Thr Leu Thr Gly Ala Gly Gly Phe Val Leu Gly Leu Ile Ile Cys Gly
1 5 10 15

Val Gly Ile Phe Met His Arg Arg Ser Lys Lys Val Gln Arg Gly Ser
20 25 30

Ala

<210> 36
<211> 9
<212> PRT
<213> Homo sapiens

<400> 36

Ser Lys Lys Val Gln Arg Gly Ser Ala
1 5

<210> 37
<211> 26
<212> PRT
<213> Homo sapiens

<400> 37

Phe Ile Ile Leu Ala Val Ile Val Pro Leu Leu Leu Leu Ile Gly Leu
1 5 10 15

Ala Leu Trp Phe Arg Lys Arg Cys Phe Cys
20 25

<210> 38
<211> 6
<212> PRT
<213> Homo sapiens

<400> 38

Arg Lys Arg Cys Phe Cys
1 5

<210> 39
<211> 30
<212> PRT
<213> Homo sapiens

<400> 39

Ile Val Leu Ala Ile Ile Val Pro Ser Leu Leu Leu Leu Leu Cys Leu
1 5 10 15

Ala Leu Trp Tyr Met Arg Arg Arg Ser Tyr Gln Asn Ile Pro
20 25 30

<210> 40

<211> 9

<212> PRT

<213> Homo sapiens

<400> 40

Arg Arg Arg Ser Tyr Gln Asn Ile Pro
1 5

<210> 41

<211> 30

<212> PRT

<213> Homo sapiens

<400> 41

Trp Ile Ala Leu Val Val Ile Val Pro Leu Val Ile Leu Ile Val Leu
1 5 10 15

Val Leu Trp Phe Lys Lys His Cys Ser Tyr Gln Asp Ile Leu
20 25 30

<210> 42

<211> 10

<212> PRT

<213> Homo sapiens

<400> 42

Lys Lys His Cys Ser Tyr Gln Asp Ile Leu
1 5 10

<210> 43

<211> 250

<212> PRT

<213> Homo sapiens

<400> 43

Met Ala Ala Gly Thr Ser Ser Tyr Trp Glu Asp Leu Arg Lys Gln Ala
1 5 10 15

Arg Gln Leu Glu Asn Glu Leu Asp Leu Lys Leu Val Ser Phe Ser Lys
20 25 30

Leu Cys Thr Ser Tyr Ser His Ser Ser Thr Arg Asp Gly Arg Arg Asp
 35 40 45

Arg Tyr Ser Ser Asp Thr Thr Pro Leu Leu Asn Gly Ser Ser Gln Asp
 50 55 60

Arg Met Phe Glu Thr Met Ala Ile Glu Ile Glu Gln Leu Leu Ala Arg
 65 70 75 80

Leu Thr Gly Val Asn Asp Lys Met Ala Glu Tyr Thr Asn Ser Ala Gly
 85 90 95

Val Pro Ser Leu Asn Ala Ala Leu Met His Thr Leu Gln Arg His Arg
 100 105 110

Asp Ile Leu Gln Asp Tyr Thr His Glu Phe His Lys Thr Lys Ala Asn
 115 120 125

Phe Met Ala Ile Arg Glu Arg Glu Asn Leu Met Gly Ser Val Arg Lys
 130 135 140

Asp Ile Glu Ser Tyr Lys Ser Gly Ser Gly Val Asn Asn Arg Arg Thr
 145 150 155 160

Glu Leu Phe Leu Lys Glu His Asp His Leu Arg Asn Ser Asp Arg Leu
 165 170 175

Ile Glu Glu Thr Ile Ser Ile Ala Met Ala Thr Lys Glu Asn Met Thr
 180 185 190

Ser Gln Arg Gly Met Leu Lys Ser Ile His Ser Lys Met Asn Thr Leu
 195 200 205

Ala Asn Arg Phe Pro Ala Val Asn Ser Leu Ile Gln Arg Ile Asn Leu
 210 215 220

Arg Lys Arg Arg Asp Ser Leu Ile Leu Gly Gly Val Ile Gly Ile Cys
 225 230 235 240

Thr Ile Leu Leu Leu Leu Tyr Ala Phe His
 245 250

<210> 44
 <211> 128

<212> PRT
<213> Homo sapiens

<400> 44

Met Gly Ala Ser Leu Thr Ser Pro Gly Thr Gln Glu Lys Leu Ile Arg
1 5 10 15

Asp Phe Asp Glu Lys Gln Gln Glu Ala Asn Lys Met Leu Thr Gln Met
20 25 30

Glu Glu Glu Leu His Tyr Ala Pro Val Ser Phe His Asn Pro Met Met
35 40 45

Ser Lys Leu Gln Asp Tyr Gln Lys Asp Leu Ala Gln Phe His Leu Glu
50 55 60

Ala Arg Thr Met Pro Gly Asp Arg Gly Asp Met Lys Tyr Gly Thr Tyr
65 70 75 80

Ala Val Glu Asn Glu His Met Asn Arg Leu Gln Ser Gln Arg Ala Met
85 90 95

Leu Leu Gln Gly Thr Lys Ser Leu Gly Arg Ala Thr Gln Glu Thr Asp
100 105 110

Gln Ile Gly Ser Glu Ile Ser Glu Glu Leu Gly Asn Gln Arg Asp Gln
115 120 125

<210> 45
<211> 212
<212> PRT
<213> Homo sapiens

<400> 45

Met Asp Pro Leu Phe Gln Gln Thr His Lys Gln Val His Glu Ile Gln
1 5 10 15

Ser Cys Met Gly Arg Leu Glu Thr Ala Asp Lys Gln Ser Val His Ile
20 25 30

Val Glu Asn Glu Ile Gln Ala Ser Ile Asp Gln Ile Phe Ser Arg Leu
35 40 45

Glu Arg Leu Glu Ile Leu Ser Ser Lys Glu Pro Pro Asn Lys Arg Gln
50 55 60

Asn Ala Arg Leu Arg Val Asp Gln Leu Lys Tyr Asp Val Gln His Leu
65 70 75 80

Gln Thr Ala Leu Arg Asn Phe Gln His Arg Arg His Ala Arg Glu Gln
85 90 95

Gln Glu Arg Gln Arg Glu Glu Leu Leu Ser Arg Thr Phe Thr Thr Asn
100 105 110

Asp Ser Asp Thr Thr Ile Pro Met Asp Glu Ser Leu Gln Phe Asn Ser
115 120 125

Ser Leu Gln Lys Val His Asn Gly Met Asp Asp Leu Ile Leu Asp Gly
130 135 140

His Asn Ile Leu Asp Gly Leu Arg Thr Gln Arg Leu Thr Leu Lys Gly
145 150 155 160

Thr Gln Lys Lys Ile Leu Asp Ile Ala Asn Met Leu Gly Leu Ser Asn
165 170 175

Thr Val Met Arg Leu Ile Glu Lys Arg Ala Phe Gln Asp Lys Tyr Phe
180 185 190

Met Ile Gly Gly Met Leu Leu Thr Cys Val Val Met Phe Leu Val Val
195 200 205

Gln Tyr Leu Thr
210

<210> 46
<211> 172
<212> PRT
<213> Homo sapiens

<400> 46

Met Ser Val Pro Gly Pro Ser Ser Pro Asp Gly Ala Leu Thr Arg Pro
1 5 10 15

Pro Tyr Cys Leu Glu Ala Gly Glu Pro Thr Pro Gly Leu Ser Asp Thr
20 25 30

Ser Pro Asp Glu Gly Leu Ile Glu Asp Leu Thr Ile Glu Asp Lys Ala
35 40 45

Val Glu Gln Leu Ala Glu Gly Leu Leu Ser His Tyr Leu Pro Asp Leu
Page 25

50

55

60

Gln Arg Ser Lys Gln Ala Leu Gln Glu Leu Thr Gln Asn Gln Val Val
65 70 75 80

Leu Leu Asp Thr Leu Glu Gln Glu Ile Ser Lys Phe Lys Glu Cys His
85 90 95

Ser Met Leu Asp Ile Asn Ala Leu Phe Ala Glu Ala Lys His Tyr His
100 105 110

Ala Lys Leu Val Asn Ile Arg Lys Glu Met Leu Met Leu His Glu Lys
115 120 125

Thr Ser Lys Leu Lys Lys Arg Ala Leu Lys Leu Gln Gln Lys Arg Gln
130 135 140

Lys Glu Glu Leu Glu Arg Glu Gln Gln Arg Glu Lys Glu Phe Glu Arg
145 150 155 160

Glu Lys Gln Leu Thr Ala Arg Pro Ala Lys Arg Met
165 170

<210> 47
<211> 301
<212> PRT
<213> Homo sapiens

<400> 47

Met Ser Cys Arg Asp Arg Thr Gln Glu Phe Leu Ser Ala Cys Lys Ser
1 5 10 15

Leu Gln Thr Arg Gln Asn Gly Ile Gln Thr Asn Lys Pro Ala Leu Arg
20 25 30

Ala Val Arg Gln Arg Ser Glu Phe Thr Leu Met Ala Lys Arg Ile Gly
35 40 45

Lys Asp Leu Ser Asn Thr Phe Ala Lys Leu Glu Lys Leu Thr Ile Leu
50 55 60

Ala Lys Arg Lys Ser Leu Phe Asp Asp Lys Ala Val Glu Ile Glu Glu
65 70 75 80

Leu Thr Tyr Ile Ile Lys Gln Asp Ile Asn Ser Leu Asn Lys Gln Ile
85 90 95

Ala Gln Leu Gln Asp Phe Val Arg Ala Lys Gly Ser Gln Ser Gly Arg
100 105 110

His Leu Gln Thr His Ser Asn Thr Ile Val Val Ser Leu Gln Ser Lys
115 120 125

Leu Ala Ser Met Ser Asn Asp Phe Lys Ser Val Leu Glu Val Arg Thr
130 135 140

Glu Asn Leu Lys Gln Gln Arg Ser Arg Arg Glu Gln Phe Ser Arg Ala
145 150 155 160

Pro Val Ser Ala Leu Pro Leu Ala Pro Asn His Leu Gly Gly Gly Ala
165 170 175

Val Val Leu Gly Ala Glu Ser His Ala Ser Lys Asp Val Ala Ile Asp
180 185 190

Met Met Asp Ser Arg Thr Ser Gln Gln Leu Gln Leu Ile Asp Glu Gln
195 200 205

Asp Ser Tyr Ile Gln Ser Arg Ala Asp Thr Met Gln Asn Ile Glu Ser
210 215 220

Thr Ile Val Glu Leu Gly Ser Ile Phe Gln Gln Leu Ala His Met Val
225 230 235 240

Lys Glu Gln Glu Glu Thr Ile Gln Arg Ile Asp Glu Asn Val Leu Gly
245 250 255

Ala Gln Leu Asp Val Glu Ala Ala His Ser Glu Ile Leu Lys Tyr Phe
260 265 270

Gln Ser Val Thr Ser Asn Arg Trp Leu Met Val Lys Ile Phe Leu Ile
275 280 285

Leu Ile Val Phe Phe Ile Ile Phe Val Val Phe Leu Ala
290 295 300

<210> 48
<211> 255
<212> PRT
<213> Homo sapiens

<400> 48

Met	Ser	Met	Glu	Asp	Pro	Phe	Phe	Val	Val	Lys	Gly	Glu	Val	Gln	Lys	1	5	10	15
Ala	Val	Asn	Thr	Ala	Gln	Gly	Leu	Phe	Gln	Arg	Trp	Thr	Glu	Leu	Leu	20	25	30	
Gln	Asp	Pro	Ser	Thr	Ala	Thr	Arg	Glu	Glu	Ile	Asp	Trp	Thr	Thr	Asn	35	40	45	
Glu	Leu	Arg	Asn	Asn	Leu	Arg	Ser	Ile	Glu	Trp	Asp	Leu	Glu	Asp	Leu	50	55	60	
Asp	Glu	Thr	Ile	Ser	Ile	Val	Glu	Ala	Asn	Pro	Arg	Lys	Phe	Asn	Leu	65	70	75	80
Asp	Ala	Thr	Glu	Leu	Ser	Ile	Arg	Lys	Ala	Phe	Ile	Thr	Ser	Thr	Arg	85	90	95	
Gln	Val	Val	Arg	Asp	Met	Lys	Asp	Gln	Met	Ser	Thr	Ser	Ser	Val	Gln	100	105	110	
Ala	Leu	Ala	Glu	Arg	Lys	Asn	Arg	Gln	Ala	Leu	Leu	Gly	Asp	Ser	Gly	115	120	125	
Ser	Gln	Asn	Trp	Ser	Thr	Gly	Thr	Thr	Asp	Lys	Tyr	Gly	Arg	Leu	Asp	130	135	140	
Arg	Glu	Leu	Gln	Arg	Ala	Asn	Ser	His	Phe	Ile	Glu	Glu	Gln	Gln	Ala	145	150	155	160
Gln	Gln	Gln	Leu	Ile	Val	Glu	Gln	Gln	Asp	Glu	Gln	Leu	Glu	Leu	Val	165	170	175	
Ser	Gly	Ser	Ile	Gly	Val	Leu	Lys	Asn	Met	Ser	Gln	Arg	Ile	Gly	Gly	180	185	190	
Glu	Leu	Glu	Glu	Gln	Ala	Val	Met	Leu	Glu	Asp	Phe	Ser	His	Glu	Leu	195	200	205	
Glu	Ser	Thr	Gln	Ser	Arg	Leu	Asp	Asn	Val	Met	Lys	Lys	Leu	Ala	Lys	210	215	220	
Val	Ser	His	Met	Thr	Ser	Asp	Arg	Arg	Gln	Trp	Cys	Ala	Ile	Ala	Ile	225	230	235	240

Leu Phe Ala Val Leu Leu Val Val Leu Ile Leu Phe Leu Val Leu
245 250 255

<210> 49
<211> 261
<212> PRT
<213> Homo sapiens
<400> 49

Met Ser Tyr Thr Pro Gly Val Gly Gly Asp Pro Ala Gln Leu Ala Gln
1 5 10 15

Arg Ile Ser Ser Asn Ile Gln Lys Ile Thr Gln Cys Ser Val Glu Ile
20 25 30

Gln Arg Thr Leu Asn Gln Leu Gly Thr Pro Gln Asp Ser Pro Glu Leu
35 40 45

Arg Gln Gln Leu Gln Gln Lys Gln Gln Tyr Thr Asn Gln Leu Ala Lys
50 55 60

Glu Thr Asp Lys Tyr Ile Lys Glu Phe Gly Ser Leu Pro Thr Thr Pro
65 70 75 80

Ser Glu Gln Arg Gln Arg Lys Ile Gln Lys Asp Arg Leu Val Ala Glu
85 90 95

Phe Thr Thr Ser Leu Thr Asn Phe Gln Lys Val Gln Arg Gln Ala Ala
100 105 110

Glu Arg Glu Lys Glu Phe Val Ala Arg Val Arg Ala Ser Ser Arg Val
115 120 125

Ser Gly Ser Phe Pro Glu Asp Ser Ser Lys Glu Arg Asn Leu Val Ser
130 135 140

Trp Glu Ser Gln Thr Gln Pro Gln Val Gln Val Gln Asp Glu Glu Ile
145 150 155 160

Thr Glu Asp Asp Leu Arg Leu Ile His Glu Arg Glu Ser Ser Ile Arg
165 170 175

Gln Leu Glu Ala Asp Ile Met Asp Ile Asn Glu Ile Phe Lys Asp Leu
180 185 190

Gly Met Met Ile His Glu Gln Gly Asp Val Ile Asp Ser Ile Glu Ala
 195 200 205

Asn Val Glu Asn Ala Glu Val His Val Gln Gln Ala Asn Gln Gln Leu
 210 215 220

Ser Arg Ala Ala Asp Tyr Gln Arg Lys Ser Arg Lys Thr Leu Cys Ile
 225 230 235 240

Ile Ile Leu Ile Leu Val Ile Gly Val Ala Ile Ile Ser Leu Ile Ile
 245 250 255

Trp Gly Leu Asn His
 260

<210> 50
 <211> 236
 <212> PRT
 <213> Homo sapiens

<400> 50

Met Ala Pro Asp Pro Trp Phe Ser Thr Tyr Asp Ser Thr Cys Gln Ile
 1 5 10 15

Ala Gln Glu Ile Ala Glu Lys Ile Gln Gln Arg Asn Gln Tyr Glu Arg
 20 25 30

Lys Gly Glu Lys Ala Pro Lys Leu Thr Val Thr Ile Arg Ala Leu Leu
 35 40 45

Gln Asn Leu Lys Glu Lys Ile Ala Leu Leu Lys Asp Leu Leu Leu Arg
 50 55 60

Ala Val Ser Thr His Gln Ile Thr Gln Leu Glu Gly Asp Arg Arg Gln
 65 70 75 80

Asn Leu Leu Asp Asp Leu Val Thr Arg Glu Arg Leu Leu Leu Ala Ser
 85 90 95

Phe Lys Asn Glu Gly Ala Glu Pro Asp Leu Ile Arg Ser Ser Leu Met
 100 105 110

Ser Glu Glu Ala Lys Arg Gly Ala Pro Asn Pro Trp Leu Phe Glu Glu
 115 120 125

Pro Glu Glu Thr Arg Gly Leu Gly Phe Asp Glu Ile Arg Gln Gln Gln

130

135

140

Gln Lys Ile Ile Gln Glu Gln Asp Ala Gly Leu Asp Ala Leu Ser Ser
 145 150 155 160

Ile Ile Ser Arg Gln Lys Gln Met Gly Gln Glu Ile Gly Asn Glu Leu
 165 170 175

Asp Glu Gln Asn Glu Ile Ile Asp Asp Leu Ala Asn Leu Val Glu Asn
 180 185 190

Thr Asp Glu Lys Leu Arg Asn Glu Thr Arg Arg Val Asn Met Val Asp
 195 200 205

Arg Lys Ser Ala Ser Cys Gly Met Ile Met Val Ile Leu Leu Leu Leu
 210 215 220

Val Ala Ile Val Val Val Ala Val Trp Pro Thr Asn
 225 230 235

<210> 51
 <211> 200
 <212> PRT
 <213> Homo sapiens

<400> 51

Met Ser Leu Glu Asp Pro Phe Phe Val Val Arg Gly Glu Val Gln Lys
 1 5 10 15

Ala Val Asn Thr Ala Arg Gly Leu Tyr Gln Arg Trp Cys Glu Leu Leu
 20 25 30

Gln Glu Ser Ala Ala Val Gly Arg Glu Glu Leu Asp Trp Thr Thr Asn
 35 40 45

Glu Leu Arg Asn Gly Leu Arg Ser Ile Glu Trp Asp Leu Glu Asp Leu
 50 55 60

Glu Glu Thr Ile Gly Ile Val Glu Ala Asn Pro Gly Lys Pro Ala Ala
 65 70 75 80

Gln Lys Ser Pro Ser Asp Leu Leu Asp Ala Ser Ala Val Ser Ala Thr
 85 90 95

Ser Arg Tyr Ile Glu Glu Gln Gln Ala Thr Gln Gln Leu Ile Met Asp
 100 105 110

Glu Gln Asp Gln Gln Leu Glu Met Val Ser Gly Ser Ile Gln Val Leu
115 120 125

Lys His Met Ser Gly Arg Val Gly Glu Glu Leu Asp Glu Gln Gly Ile
130 135 140

Met Leu Asp Ala Phe Ala Gln Glu Met Asp His Thr Gln Ser Arg Met
145 150 155 160

Asp Gly Val Leu Arg Lys Leu Ala Lys Val Ser His Met Thr Ser Asp
165 170 175

Arg Arg Gln Trp Cys Ala Ile Ala Val Leu Val Gly Val Leu Leu Leu
180 185 190

Val Leu Ile Leu Leu Phe Ser Leu
195 200

<210> 52
<211> 249
<212> PRT
<213> Homo sapiens

<400> 52

Met Ser Leu Glu Asp Pro Phe Phe Val Val Arg Gly Glu Val Gln Lys
1 5 10 15

Ala Val Asn Thr Ala Arg Gly Leu Tyr Gln Arg Trp Cys Glu Leu Leu
20 25 30

Gln Glu Ser Ala Ala Val Gly Arg Glu Glu Leu Asp Trp Thr Thr Asn
35 40 45

Glu Leu Arg Asn Gly Leu Arg Ser Ile Glu Trp Asp Leu Glu Asp Leu
50 55 60

Glu Glu Thr Ile Gly Ile Val Glu Ala Asn Pro Gly Lys Phe Lys Leu
65 70 75 80

Pro Ala Gly Asp Leu Gln Glu Arg Lys Val Phe Val Glu Arg Met Arg
85 90 95

Glu Ala Val Gln Glu Met Lys Asp His Met Val Ser Pro Thr Ala Val
100 105 110

Ala Phe Leu Glu Arg Asn Asn Arg Glu Ile Leu Ala Gly Lys Pro Ala
115 120 125

Ala Gln Lys Ser Pro Ser Asp Leu Leu Asp Ala Ser Ala Val Ser Ala
130 135 140

Thr Ser Arg Tyr Ile Glu Glu Gln Gln Ala Thr Gln Gln Leu Ile Met
145 150 155 160

Asp Glu Gln Asp Gln Gln Leu Glu Met Val Ser Gly Ser Ile Gln Val
165 170 175

Leu Lys His Met Ser Gly Arg Val Gly Glu Glu Leu Asp Glu Gln Gly
180 185 190

Ile Met Leu Asp Ala Phe Ala Gln Glu Met Asp His Thr Gln Ser Arg
195 200 205

Met Asp Gly Val Leu Arg Lys Leu Ala Lys Val Ser His Met Thr Ser
210 215 220

Asp Arg Arg Gln Trp Cys Ala Ile Ala Val Leu Val Gly Val Leu Leu
225 230 235 240

Leu Val Leu Ile Leu Leu Phe Ser Leu
245

<210> 53
<211> 287
<212> PRT
<213> Homo sapiens

<400> 53

Met Lys Asp Arg Leu Ala Glu Leu Leu Asp Leu Ser Lys Gln Tyr Asp
1 5 10 15

Gln Gln Phe Pro Asp Gly Asp Asp Glu Phe Asp Ser Pro His Glu Asp
20 25 30

Ile Val Phe Glu Thr Asp His Ile Leu Glu Ser Leu Tyr Arg Asp Ile
35 40 45

Arg Asp Ile Gln Asp Glu Asn Gln Leu Leu Val Ala Asp Val Lys Arg
50 55 60

Leu Gly Lys Gln Asn Ala Arg Phe Leu Thr Ser Met Arg Arg Leu Ser
65 70 75 80

Ser Ile Lys Arg Asp Thr Asn Ser Ile Ala Lys Ala Phe Arg Ala Arg
85 90 95

Gly Glu Val Ile His Cys Lys Leu Arg Ala Met Lys Glu Leu Ser Glu
100 105 110

Ala Ala Glu Ala Gln His Gly Pro His Ser Ala Val Ala Arg Ile Ser
115 120 125

Arg Ala Gln Tyr Asn Ala Leu Thr Leu Thr Phe Gln Arg Ala Met His
130 135 140

Asp Tyr Asn Gln Ala Glu Met Lys Gln Arg Asp Asn Cys Lys Ile Arg
145 150 155 160

Ile Gln Arg Gln Leu Glu Ile Met Gly Lys Glu Val Ser Gly Asp Gln
165 170 175

Ile Glu Asp Met Phe Glu Gln Gly Lys Trp Asp Val Phe Ser Glu Asn
180 185 190

Leu Leu Ala Asp Val Lys Gly Arg Gly Pro Pro Thr Thr Arg Ser Arg
195 200 205

Ala Ala Thr Ala Asn Cys Cys Ala Trp Arg Ala Ala Ile Arg Asp Val
210 215 220

His Glu Leu Phe Leu Gln Met Ala Val Leu Val Glu Lys Gln Ala Asp
225 230 235 240

Thr Leu Asn Val Ile Glu Leu Asn Val Gln Lys Thr Val Asp Tyr Thr
245 250 255

Gly Gln Ala Lys Ala Gln Val Arg Lys Ala Val Gln Tyr Glu Glu Lys
260 265 270

Asn Pro Cys Arg Thr Leu Cys Cys Phe Cys Cys Pro Cys Leu Lys
275 280 285

<210> 54
<211> 276
<212> PRT
<213> Homo sapiens

<400> 54

Met Ser Tyr Gly Pro Leu Asp Met Tyr Arg Asn Pro Gly Pro Ser Gly
1 5 10 15

Pro Gln Leu Arg Asp Phe Ser Ser Ile Ile Gln Thr Cys Ser Gly Asn
20 25 30

Ile Gln Arg Ile Ser Gln Ala Thr Ala Gln Ile Lys Asn Leu Met Ser
35 40 45

Gln Leu Gly Thr Lys Gln Asp Ser Ser Lys Leu Gln Glu Asn Leu Gln
50 55 60

Gln Leu Gln His Ser Thr Asn Gln Leu Ala Lys Glu Thr Asn Glu Leu
65 70 75 80

Leu Lys Glu Leu Gly Ser Leu Pro Leu Pro Leu Ser Thr Ser Glu Gln
85 90 95

Arg Gln Gln Arg Leu Gln Lys Glu Arg Leu Met Asn Asp Phe Ser Ala
100 105 110

Ala Leu Asn Asn Phe Gln Ala Val Gln Arg Arg Val Ser Glu Lys Glu
115 120 125

Lys Glu Ser Ile Ala Arg Ala Arg Ala Gly Ser Arg Leu Ser Ala Glu
130 135 140

Glu Arg Gln Arg Glu Glu Gln Leu Val Ser Phe Asp Ser His Glu Glu
145 150 155 160

Trp Asn Gln Met Gln Ser Gln Glu Asp Glu Val Ala Ile Thr Glu Gln
165 170 175

Asp Leu Glu Leu Ile Lys Glu Arg Glu Thr Ala Ile Arg Gln Leu Glu
180 185 190

Ala Asp Ile Leu Asp Val Asn Gln Ile Phe Lys Asp Leu Ala Met Met
195 200 205

Ile His Asp Gln Gly Asp Leu Ile Asp Ser Ile Glu Ala Asn Val Glu
210 215 220

Ser Ser Glu Val His Val Glu Arg Ala Thr Glu Gln Leu Gln Arg Ala

Glu Ile Pro Gln Asp Gln Asn Ala Ala Glu Ser Arg Glu Thr Leu Glu
165 170 175

Ala Asp Leu Ile Glu Leu Ser Gln Leu Val Thr Asp Phe Ser Leu Leu
180 185 190

Val Asn Ser Gln Gln Glu Lys Ile Asp Ser Ile Ala Asp His Val Asn
195 200 205

Ser Ala Ala Val Asn Val Glu Glu Gly Thr Lys Asn Leu Gly Lys Ala
210 215 220

Ala Lys Tyr Lys Leu Ala Ala Leu Pro Val Ala Gly Ala Leu Ile Gly
225 230 235 240

Gly Met Val Gly Gly Pro Ile Gly Leu Leu Ala Cys Phe Lys Val Ala
245 250 255

Gly Ile Ala Ala Ala Leu Gly Gly Gly Val Leu Gly Phe Thr Gly Gly
260 265 270

Lys Leu Ile Gln Arg Lys Lys Gln Lys Met Met Glu Lys Leu Thr Ser
275 280 285

Ser Cys Pro Asp Leu Pro Ser Gln Thr Asp Lys Lys Cys Ser
290 295 300

<210> 56
<211> 116
<212> PRT
<213> Homo sapiens

<400> 56

Met Ser Ala Thr Ala Ala Thr Ala Pro Pro Ala Ala Pro Ala Gly Glu
1 5 10 15

Gly Gly Pro Pro Ala Pro Pro Pro Asn Leu Thr Ser Asn Arg Arg Leu
20 25 30

Gln Gln Thr Gln Ala Gln Val Asp Glu Val Val Asp Ile Met Arg Val
35 40 45

Asn Val Asp Lys Val Leu Glu Arg Asp Gln Lys Leu Ser Glu Leu Asp
50 55 60

Asp Arg Ala Asp Ala Leu Gln Ala Gly Ala Ser Gln Phe Glu Thr Ser
65 70 75 80

Ala Ala Lys Leu Lys Arg Lys Tyr Trp Trp Lys Asn Leu Lys Met Met
85 90 95

Ile Ile Leu Gly Val Ile Cys Ala Ile Ile Leu Ile Ile Ile Ile Val
100 105 110

Tyr Phe Ser Ser
115

<210> 57
<211> 100
<212> PRT
<213> Homo sapiens

<400> 57

Met Ser Thr Gly Pro Thr Ala Ala Thr Gly Ser Asn Arg Arg Leu Gln
1 5 10 15

Gln Thr Gln Asn Gln Val Asp Glu Val Val Asp Ile Met Arg Val Asn
20 25 30

Val Asp Lys Val Leu Glu Arg Asp Gln Lys Leu Ser Glu Leu Asp Asp
35 40 45

Arg Ala Asp Ala Leu Gln Ala Gly Ala Ser Gln Phe Glu Thr Ser Ala
50 55 60

Ala Lys Leu Lys Arg Lys Tyr Trp Trp Lys Asn Cys Lys Met Trp Ala
65 70 75 80

Ile Gly Ile Thr Val Leu Val Ile Phe Ile Ile Ile Ile Ile Val Trp
85 90 95

Val Val Ser Ser
100

<210> 58
<211> 141
<212> PRT
<213> Homo sapiens

<400> 58

Met Pro Pro Lys Phe Lys Arg His Leu Asn Asp Asp Asp Val Thr Gly

1	5	10	15
Ser Val Lys	Ser Glu Arg Arg	Asn Leu Leu Glu Asp Asp	Ser Asp Glu
	20	25	30
Glu Glu Asp	Phe Phe Leu Arg	Gly Pro Ser Gly Pro Arg	Phe Gly Pro
	35	40	45
Arg Asn Asp	Lys Ile Lys His	Val Gln Asn Gln Val Asp	Glu Val Ile
	50	55	60
Asp Val Met	Pro Glu Asn Ile Thr	Lys Val Ile Glu Arg Gly	Glu Arg
65	70	75	80
Leu Asp Glu	Leu Gln Asp Lys Ser	Glu Ser Leu Ser Asp	Asn Ala Thr
	85	90	95
Ala Phe Ser	Asn Arg Ser Lys Gln	Leu Arg Arg Gln Met	Trp Trp Arg
	100	105	110
Gly Cys Lys	Ile Lys Ala Ile Met	Ala Leu Val Ala Ala	Ile Leu Leu
	115	120	125
Leu Val Ile	Ile Ile Leu Ile Val	Met Lys Tyr Arg Thr	
	130	135	140
<210> 59			
<211> 220			
<212> PRT			
<213> Homo sapiens			
<400> 59			
Met Ala Ile	Leu Phe Ala Val Val	Ala Arg Gly Thr Thr	Ile Leu Ala
1	5	10	15
Lys His Ala	Trp Cys Gly Gly Asn	Phe Leu Glu Val Thr	Glu Gln Ile
	20	25	30
Leu Ala Lys	Ile Pro Ser Glu Asn	Asn Lys Leu Thr Tyr	Ser His Gly
	35	40	45
Asn Tyr Leu	Phe His Tyr Ile Cys	Gln Asp Arg Ile Val	Tyr Leu Cys
	50	55	60
Ile Thr Asp	Asp Asp Phe Glu Arg	Ser Arg Ala Phe Asn	Phe Leu Asn
65	70	75	80

Glu Ile Lys Lys Arg Phe Gln Thr Thr Tyr Gly Ser Arg Ala Gln Thr
85 90 95

Ala Leu Pro Tyr Ala Met Asn Ser Glu Phe Ser Ser Val Leu Ala Ala
100 105 110

Gln Leu Lys His His Ser Glu Asn Lys Gly Leu Asp Lys Val Met Glu
115 120 125

Thr Gln Ala Gln Val Asp Glu Leu Lys Gly Ile Met Val Arg Asn Ile
130 135 140

Asp Leu Val Ala Gln Arg Gly Glu Arg Leu Glu Leu Leu Ile Asp Lys
145 150 155 160

Thr Glu Asn Leu Val Asp Ser Ser Val Thr Phe Lys Thr Thr Ser Arg
165 170 175

Asn Leu Ala Arg Ala Met Cys Met Lys Asn Leu Lys Leu Thr Ile Ile
180 185 190

Ile Ile Ile Val Ser Ile Val Phe Ile Tyr Ile Ile Val Ser Pro Leu
195 200 205

Cys Gly Gly Phe Thr Trp Pro Ser Cys Val Lys Lys
210 215 220

<210> 60
<211> 100
<212> PRT
<213> Homo sapiens

<400> 60

Met Glu Glu Ala Ser Glu Gly Gly Gly Asn Asp Arg Val Arg Asn Leu
1 5 10 15

Gln Ser Glu Val Glu Gly Val Lys Asn Ile Met Thr Gln Asn Val Glu
20 25 30

Arg Ile Leu Ala Arg Gly Glu Asn Leu Glu His Leu Arg Asn Lys Thr
35 40 45

Glu Asp Leu Glu Ala Thr Ser Glu His Phe Lys Thr Thr Ser Gln Lys
50 55 60

Val Ala Arg Lys Phe Trp Trp Lys Asn Val Lys Met Ile Val Leu Ile
65 70 75 80

Cys Val Ile Val Phe Ile Ile Ile Leu Phe Ile Val Leu Phe Ala Thr
85 90 95

Gly Ala Phe Ser
100

<210> 61
<211> 203
<212> PRT
<213> Homo sapiens

<400> 61

Met Ser Ser Asp Phe Glu Gly Tyr Glu Gln Asp Phe Ala Val Leu Thr
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Ala Glu Ile Thr Ser Lys Ile Ala Arg Val Pro Arg Leu Pro Pro Asp
20 25 30

Glu Lys Lys Gln Met Val Ala Asn Val Glu Lys Gln Leu Glu Glu Ala
35 40 45

Lys Glu Leu Leu Glu Gln Met Asp Leu Glu Val Arg Glu Ile Pro Pro
50 55 60

Gln Ser Arg Gly Met Tyr Ser Asn Arg Met Arg Ser Tyr Lys Gln Glu
65 70 75 80

Met Gly Lys Leu Glu Thr Asp Phe Lys Arg Ser Arg Ile Ala Tyr Ser
85 90 95

Asp Glu Val Arg Asn Glu Leu Leu Gly Asp Asp Gly Asn Ser Ser Glu
100 105 110

Asn Gln Arg Ala His Leu Leu Asp Asn Thr Glu Arg Leu Glu Arg Ser
115 120 125

Ser Arg Arg Leu Glu Ala Gly Tyr Gln Ile Ala Val Glu Thr Glu Gln
130 135 140

Ile Gly Gln Glu Met Leu Glu Asn Leu Ser His Asp Arg Glu Lys Ile
145 150 155 160

Gln Arg Ala Arg Glu Arg Leu Arg Glu Thr Asp Ala Asn Leu Gly Lys
 165 170 175

Ser Ser Arg Ile Leu Thr Gly Met Leu Arg Arg Gly Cys Ser Val Lys
 180 185 190

Lys Gln Cys Asn Leu Ser Leu Ala Pro Lys Ala
 195 200

<210> 62
 <211> 269
 <212> PRT
 <213> Homo sapiens

<400> 62

Met Arg Asp Arg Leu Pro Asp Leu Thr Ala Cys Arg Lys Asn Asp Asp
 1 5 10 15

Gly Asp Thr Val Val Val Val Glu Lys Asp His Phe Met Asp Asp Phe
 20 25 30

Phe His Gln Val Glu Glu Ile Arg Asn Ser Ile Asp Lys Ile Thr Gln
 35 40 45

Tyr Val Glu Glu Val Lys Lys Asn His Ser Ile Ile Leu Ser Ala Pro
 50 55 60

Asn Pro Glu Gly Lys Ile Lys Glu Glu Leu Glu Asp Leu Asn Lys Glu
 65 70 75 80

Ile Lys Lys Thr Ala Asn Lys Ile Arg Ala Lys Leu Lys Ala Ile Glu
 85 90 95

Gln Ser Phe Asp Gln Asp Glu Ser Gly Asn Arg Thr Ser Val Asp Leu
 100 105 110

Arg Ile Arg Arg Thr Gln His Ser Val Leu Ser Arg Lys Phe Val Glu
 115 120 125

Ala Met Ala Glu Tyr Asn Glu Ala Gln Thr Leu Phe Arg Glu Arg Ser
 130 135 140

Lys Gly Arg Ile Gln Arg Gln Leu Glu Ile Thr Gly Arg Thr Thr Thr
 145 150 155 160

Asp Asp Glu Leu Glu Glu Met Leu Glu Ser Gly Lys Pro Ser Ile Phe

165

170

175

Thr Ser Asp Ile Ile Ser Asp Ser Gln Ile Thr Arg Gln Ala Leu Asn
 180 185 190

Glu Ile Glu Ser Arg His Lys Asp Ile Met Lys Leu Glu Thr Ser Ile
 195 200 205

Arg Glu Leu His Glu Met Phe Met Asp Met Ala Met Phe Val Glu Thr
 210 215 220

Gln Gly Glu Met Ile Asn Asn Ile Glu Arg Asn Val Met Asn Ala Thr
 225 230 235 240

Asp Tyr Val Glu His Ala Lys Glu Glu Thr Lys Lys Ala Ile Lys Tyr
 245 250 255

Gln Ser Lys Ala Arg Arg Val Ser Leu Ala Ser Lys Asn
 260 265

<210> 63
 <211> 222
 <212> PRT
 <213> Homo sapiens

<400> 63

Gln Met Ala Ala Leu Ala Pro Leu Pro Pro Leu Pro Ala Gln Phe Lys
 1 5 10 15

Ser Ile Gln His His Leu Arg Thr Ala Gln Glu His Asp Lys Arg Asp
 20 25 30

Pro Val Val Ala Tyr Tyr Cys Arg Leu Tyr Ala Met Gln Thr Gly Met
 35 40 45

Lys Ile Asp Ser Lys Thr Pro Glu Cys Arg Lys Phe Leu Ser Lys Leu
 50 55 60

Met Asp Gln Leu Glu Ala Leu Lys Lys Gln Leu Gly Asp Asn Glu Ala
 65 70 75 80

Ile Thr Gln Glu Ile Val Gly Cys Ala Leu Glu Asn Tyr Ala Leu Lys
 85 90 95

Met Phe Leu Tyr Ala Asp Asn Glu Asp Arg Ala Gly Arg Phe His Lys
 100 105 110

Asn	Met	Ile	Lys	Ser	Phe	Tyr	Thr	Ala	Ser	Leu	Leu	Ile	Asp	Val	Ile
		115					120					125			
Thr	Val	Phe	Gly	Glu	Leu	Thr	Asp	Glu	Asn	Val	Lys	His	Arg	Lys	Tyr
	130					135					140				
Ala	Arg	Trp	Lys	Ala	Thr	Tyr	Ile	His	Asn	Cys	Leu	Lys	Glu	Trp	Gly
145					150					155					160
Asp	Ser	Ser	Ser	Arg	Pro	Cys	Trp	Glu	Leu	Lys	Lys	Ile	Met	Ile	Leu
				165					170					175	
Lys	Lys	Met	Lys	Met	Leu	Glu	Gln	Pro	Leu	Cys	Pro	Leu	Ser	Gln	Leu
			180					185					190		
Ser	His	His	His	Leu	Gln	Leu	Met	Thr	Gln	Gln	His	Ala	Ile	Arg	Gln
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Leu	Tyr	Trp	Asn	Thr	Asp	Ser	Ser	Gly	Cys	Thr	Arg	Ser	Ser		
	210					215					220				

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 <212> DNA
 <213> Homo sapiens

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gccattgccg ccctggagtt gctgccaggg gagctcttcc cgccactctt catggcagcc	180
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cttgatggac ttgatgtgct ccttgcccag gaggttcgcc ccaggaggtg gaaacttcaa	360
gtgctggatt tacggaagaa ctctcatcag gacttctgga ctgtatggtc tggaaacagg	420
gccagtctgt actcatttcc agagccagaa gcagctcagc ccatgacaaa gaagcgaaaa	480
gtagatggtt tgagcacaga ggcagagcag cccttcattc cagtagaggt gctcgtagac	540
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cgaagaaaa atgtactacg cctgtgctgt aagaagctga agatttttgc aatgcccatg	660
caggatatca agatgatcct gaaaatggtg cagctggact ctattgaaga tttggaagtg	720

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 <212> DNA
 <213> Homo sapiens

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gcgcccccg	gcgcttcggc ttacgggtcg ttgggcggcc ccgcgcgcgc accggctccg 180
ccgccacccc	cgccgcgcgc gcctcactcc ttcattcaaac aggagccgag ctggggcggc 240
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tacagcagtg	acaatttata ccaaatagaca tcccagcttg aatgcatgac ctggaatcag 720

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caggatgtgc gacgtgtgcc tggagtagcc ccgactcttg tacggtcggc atctgagacc	900
agtgagaaac gccccttcac gtgtgcttac ccaggctgca ataagagata ttttaagctg	960
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aaggactgtg aacgaagggt ttctcggtca gaccagctca aaagacacca aaggagacat	1080
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ctgaagaccc acaccaggac tcatacaggt aaaacaagtg aaaagccctt cagctgtcgg	1200
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catcagagaa acatgaccaa actccagctg gcgctt	1296

<210> 66
 <211> 1179
 <212> DNA
 <213> Homo sapiens

<400> 66	
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gatgatttga tgctgtcccc ggacgatatt gaacaatggg tcaactgaaga cccagggtcca	180
gatgaagctc ccagaatgcc agaggctgct ccccgcggtg cccctgcacc agcagctcct	240
acaccggcgg cccctgcacc agccccctcc tggccccctgt catcttctgt cccttcccag	300
aaaacctacc agggcagcta cggtttccgt ctgggcttct tgcattctgg gacagccaag	360
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gccatctaca agcagtcaca gcacatgacg gaggttgtga ggcgctgccc ccaccatgag	540
cgctgctcag atagcgatgg tctggcccc cctcagcatc ttatccgagt ggaaggaaat	600
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aaaaaactca tgttcaagac agaagggcct gactcagac	1179